Since that time he contributed papers to various societies, other than those already mentioned, and to various journals. These are chiefly on questions relating to economic geology, such as water-supply, petroleum, and coal in south-eastern England; and are too many to be noticed here. His name also appears, of course, as author, or part author, on many sheets of the maps and sections of the Geological Survey.

It is not only, however, by his published works that Mr. Topley is known—in science his was a public life. He took a marked part in the work of the British Association, and was secretary of its Geological Section for no less than fifteen years—one of the longest of such secretarial lives. He also served on some committees, and was secretary of that on coast erosion, the reports of which owe much to him. He served on the councils of the Geological Society and of the Geologists' Association for many years, and was president of the latter body for two years (1885–7). He took part in most of the international geological congresses, and worked hard for the great one in London, of which he was a secretary, in 1888. He was also for some time a sub-editor, and afterwards editor, of the *Geological Record*.

In his latter years, his presence at the Geological Survey Office, for a period of about fourteen years, brought him into contact with many people, who benefited by his knowledge and by his readiness in imparting it. Amongst engineers and others he was widely known as an expert of the most trustworthy kind on questions of water-supply, and of other subjects in which geologic knowledge comes in.

Happy in his domestic relations, of a kindly, cheerful disposition, good-natured and hospitable, he was always ready to help his brethren of the hammer, as well as all those who went to the Survey Office for information; indeed, a former colleague has said of him, to the writer, that his one prominent fault was excessive amiability.

He will be greatly missed by his colleagues, and his loss will be felt over a much wider circle—in fact, by all who knew him. W. W.

NOTES.

Two letters of Charles Darwin are published for the first time in the *Bulletin* of the Royal Botanic Gardens, Trinidad, No. 22, April 1894. These letters were addressed, before the completion of Darwin's book on the fertilisation of orchids, to the late Dr. Herman Cruger, who was Government Botanist at Trinidad for some years, asking him to observe if possible the fertilisation of certain species of the Melastomads. In the first letter he expresses a suspicion that the flowers which have the singular projections, or horns from their anthers, may be visited by small insects which penetrate one of the horns of the anther with their proboscis, to obtain the fluid contained in them. In the second letter he admits that this suspicion is quite groundless, and asks for information with regard to any instances of "bud-variation" in plants from the warmer regions cultivated in the West Indies.

The Botanical Society of America is about to try the experiment of admitting working naturalists only to its full fellowship. By a unanimous vote the Society has adopted a new constitution providing that none but American botanists engaged in research, who have published work of recognised merit, shall be eligible to active membership. Candidates for active membership must be recommended by three active members of the Society, but any nominee may be objected to by any member, and if ten members object, the name will not be considered by the Council. Nominees may be rejected by two negative votes in the Council, which numbers seven members, or by one-fifth of the votes cast after the name has been approved. The President of the Society for the present year is Prof. W. Trelease; the Vice-president, Prof. N. L. Britton; the Secretary, Mr. C. R. Barnes; the Treasurer, Mr. J. Donnell Smith.

Dr. T. Lauder Brunton, F.R.S., will deliver the annual Harveian oration at the Royal College of Physicians, on Thursday, October 18, at 4 p.m.

Two new wings of the Durham College of Science were inaugurated on Tuesday. The wings include apartments to be devoted to the study of engineering and the fine arts.

On Friday last, the Duke and Duchess of York opened the new medical school, erected at a cost of £40,000, in connection with the Yorkshire College, Leeds, and also a new central hall and library, which have been added to the College at a cost of £20,000.

The Essex Field Club will hold its annual cryptogamic and botanical meeting on Saturday, October 13. The headquarters for the meeting is the "King's Oak" Hotel, High Beach, Epping Forest.

The opening meeting of the Royal Microscopical Society will take place on Wednesday, October 17, at 8 p.m., when Mr. F. Chapman will read a paper "On the Foraminifera of the Gault of Folkestone"; and Dr. H. Stolterfoth will give some notes on the genus *Corethron*.

A meeting of the Institution of Mechanical Engineers will be held on Wednesday evening, October 24, and Thursday evening, October 25. The following papers will be read and discussed, as far as time permits:—"The Manufacture of Standard Screws for Machine-made Watches," by Mr. Charles J. Hewitt (Wednesday); "Drilling Machines for Cylindrical Boiler Shells," by Mr. Samuel Dixon (Thursday).

It is reported that a violent storm passed over the town of Little Rock, Arkansas, at the beginning of last week. Though the storm or tornado only lasted three minutes, eight persons were killed during that time, and several were seriously injured, while property was damaged to an amount estimated at £200,000. The direction of motion of the disturbance was from south-west to north-east, and the width of the path traversed was only about two hundred yards. The storm was accompanied by heavy rain, and was followed by brilliant lightning.

One of the most valuable and extensive botanical libraries in the country, that collected by Prof. Lindley, has been for many years deposited in the rooms of the Royal Horticultural Society, under the care of trustees. It is now proposed to increase the value of the Lindley Library by forming, in connection with it, a library fund, to be administered by the trustees in connection with the Council of the Royal Horticultural Society. The money would be expended in cataloguing the library, and in the purchase of new books, for which the income at present at the command of the trustees does not suffice. Donations of horticultural and botanical works are also desired.

The Berlin correspondent of the *Times* reports:—"The death is announced of Prof. Pringsheim, the well-known German botanist, at the age of seventy-one. As early as his thirty-third year he was elected member of the Berlin Academy of Sciences in appreciation of his researches and writings, which dealt especially with the processes of fructification and germination in the family of the Algæ. From 1864 to 1868 he filled the post of Professor of Botany at Jena, where he founded the first Institute for Vegetable Physiology, and this example was soon followed in other parts of Germany. Prof. Pringsheim returned to Berlin in 1868 and established a private laboratory, in which he carried out valuable investigations on the sexual life of the lowest vegetable organisms."

MR. H. J. MACKINDER commenced a course of lectures on the History of Geography and Geographical Discovery, at Gresham College, on Monday evening. The course, which will consist of twenty-five lectures, has been arranged for jointly by the Geographical Society and the London Society for the Extension of University Teaching.

PROF. RICHTER, of Graz, has been engaged for some time in making a careful bathymetrical survey of the Lake of Garda. By the use of an unusually light and compact wire-sounding machine he has been able to obtain rapid soundings, even in the greatest depths (364 metres) with a lead weighing only 800 grammes, and he is preparing a contoured map of the lake-basin.

EFFORTS were made this summer by several expeditions to ascertain the fate of the Swedish naturalists, Björling and Kalstennius, but no information has yet been received. The *Falcon* called at the Carey Islands, Clarence Head, and Cape Faraday, but found no trace of the unfortunate young men, while the most careful inquiries amongst the Eskimos of the Greenland coast elicited no news. There is no farther probability of their survival.

THE Arctic exploring parties at work during the season just past have not been by any means so successful as might have been expected. The weather seems to have been exceptionally unfavourable, and to have greatly hampered the movements of even the best equipped and most experienced Arctic travellers. Lieut. Peary has not felt justified in returning to America, although Mrs. Peary and her baby came back in the ship sent for their relief. Mr. Peary started on his main journey, after wintering at Bowdoin Bay, on March 6, with eight men, twelve sledges, and a large number of dogs. The cold encountered was very great, the thermometer falling to – 60° F., and very high wind was occasionally experienced. The expedition pushed on for twenty-seven days in the direction of Independence Bay, but only succeeded in travelling 220 miles when the death of most of the dogs from cold, and the disablement of some of the men, made it necessary to return, and Bowdoin Bay was regained on April 18. Thus Peary was unable even to reach the starting-point he had fixed upon as the base whence to push northward, and he had to content himself with making a detailed survey of Bowdoin Bay and the neighbouring coast of Inglefield Gulf during the summer. The *Falcon* arrived to his relief on August 20, and after landing a year's provisions, left him determined to make another resolute attempt to reach the new land beyond Independence Bay next spring.

THE Report of the Australian Museum, Sydney, for the year 1893, shows that the Government retrenchment scheme has caused the museum to suffer severely. There have been no funds to purchase specimens, nor to publish the results of investigation. At the commencement of the year there were thirty three officers and workmen on the staff, but owing to the necessity for retrenchment twelve of these were discharged, and the salaries of most of the others were reduced by amounts varying from £5 to £50. The amount voted for the ordinary service of the museum in 1892 was £7150, while in 1893 it was reduced to £3862. The trustees point out that it will be difficult to carry on the institution efficiently out of the reduced vote. It appears that in the parts of the museum open to the public, there are not hands enough now to keep the outside of the cases free from dust, although the specimens in them are duly cared for, and are in good order; the windows have not been properly cleaned for months, and the grounds are being over-run with weeds. Dr. E. P. Ramsay has recently retired from the directorship, owing to ill-health, and has been succeeded by Mr. R. Etheridge, jun.

PROF. A. KLOSSOVSKY, director of the observatory at Odessa, has published an interesting paper on the annual distribution of thunderstorms over the globe, accompanied by a coloured map showing their intensity in different localities. The question has hitherto been but little studied, as it is necessary to have a long series of observations in order to arrive at satisfactory mean values. He points out that a high temperature, a certain degree of humidity, and a considerable amount of rainfall, are the principal agents which favour the development of thunderstorms. The map shows that a zone of electric activity of great intensity exists on both sides of the equator, and this is also the zone of greatest rainfall. This zone is divided into three sections: (1) That embracing Asia and Oceania, Indo-China and the Sunda Isles to New Guinea, the yearly average amounting to ninety or one hundred storms. (2) The zone starting from the west coast of Africa, between 5° and 10° N. latitude, and 10° to 15° S. latitude. (3) The tropical regions of America, where the mean annual number of storms exceeds one hundred between 20° and 22° N. latitude. To the north of the zone which he terms the electric equator the number of storms decreases, we reach the deserts of Africa, Egypt, Persia, and Central Asia, where rainfall is scanty. To the north of the zone of deserts, especially over the continents of Europe and Asia, the electric activity is somewhat increased. For the high latitudes of the southern hemisphere, the principal data refer to the Falkland Islands, where the average number of storms is four. The sketch is necessarily very imperfect, but the subject is worthy of consideration and further investigation; and the author points out that, in his opinion, the solution of many meteorological phenomena is connected with atmospherical electricity.

A BRIEF account of the great Constantinople earthquake of July 10 has been already written by M. D. Eginitis, director of the Observatory of Athens (*Comptus Rendus*, vol. cxix. pp. 480-483). It occurred at 12h. 24m. p.m. Constantinople mean time. The earthquake consisted of three violent shocks, separated by very short intervals, and lasting altogether seventeen to eighteen seconds. The first and slightest was horizontal; the second, by which most of the damage was done, vertical and rotatory; and the third, undulatory and towards the end horizontal. The epicentral area, that of greatest damage, is in the form of an elongated ellipse; the major axis is 175 km. long, and extends from Tchataltza to Ada-bazar along the Gulf of Ismed; the minor axis is situated between the villages of Katirly and Maltépé, at the mouth of the gulf, and is 39 km. in length. At all parts of the epicentre the three shocks had approximately the same direction, nearly perpendicular to the major axis. The intensity was greatest in the islands of Halki and Antigoni. The fissures are few in number, the most important being at Ambarly, a village built on alluvial soil. This one is 3 km. long, 0·08 m. in maximum breadth, and runs east and west, *i.e.* parallel to the neighbouring sea-coast, which is 300 m. distant. The Kartal-Dardanelles cable was cut in several places, as if by a knife. The sea was greatly agitated along the epicentral coast. In some parts, it was observed to retreat for about 200 m., and after some oscillations to return to its normal condition. The depth of the seismic focus was found by Dutton and Hayden's method to be 34 km., and this agrees closely with the value obtained by M. Lacome from the observed times of the shock at different places. The shock travelled to Paris, Pavlovsk and Bucharest, with velocities of 3, 3·5 and 3·6 km. per second, respectively (see NATURE, vol. l. pp. 450-451).

THE *Zeitschrift für Instrumentenkunde* contains some particulars of the new method, adopted by Signor G. Guglielmo, for the exact measurement of differences of pressure. Instead of enlarging the displacement of the mercury column in the manometer or barometer by means of a capillary filled with oil, or containing an air-bubble, the new method is based upon the principle of readjusting the level to a fixed mark by the addition or subtraction of mercury, the quantity added or subtracted being weighed or measured with a burette. If the sectional area of the burette is one-hundredth of that of the manometer tube, a displacement in the former of 1 mm. will indicate a difference of pressure of 0·01 mm. To make the method sensitive it is best to use water as the manometer liquid, and to add or subtract mercury, which is more easily measured. The chief desideratum is a simple method of adding or subtracting, which is best done by attaching a sucking-tube to the top of the burette. A pointer is fixed inside the manometer tube opposite the centre of the meniscus. By observing the reflection of the pointer in the surface, and the depressions or elevations produced by the pointer, the observer is able to fix upon the mark to within 0·001 mm. If mercury is used, an electric contact is desirable. For barometer readings, pointers can be mounted in both branches of the tube, and measurements taken for both. Signor Guglielmo has also constructed an absolute electrometer based upon this principle, in which the level of mercury in a flat dish communicating with another is disturbed by a charged disc, and readjusted by adding or subtracting mercury.

WE have received from Dr. Luigi Palazzo, of the Meteorological Office at Rome, an account of a small portable unifilar magnetometer which he has designed, and which is being employed in the study of local magnetic disturbances in Italy. Signor Palazzo does not claim any special novelty in the general design, which in many respects resembles the Kew form of portable unifilar. The instrument is designed for observing the declination and horizontal force at strings of stations at one of which the elements have been determined by means of one of the more accurate and cumbersome forms of instrument. For the purpose in view it was of importance to have an instrument which should combine extreme lightness with portability, so that the different sets of observations along a line of stations might be quickly taken, and thus, to a certain extent, the effects of disturbances minimised, since there does not seem to be a self-recording magnetograph in the district under investigation, from the photographic records of which the disturbances could be eliminated. The azimuth circle has a diameter of 8 cm. and carries the graduations on the rim, a method of graduating the circle which, unless the tripod is very high, and therefore unstable, renders the reading of the verniers a matter of difficulty. The magnet employed is a hollow cylinder, as in the Kew instrument, carrying a photographic scale at one end and a lens at the other. The mirror which is used for illuminating the scale, as well as for reflecting the rays of the sun when determining the geographical meridian, is composed of a piece of parallel-sided plane unsilvered glass mounted on trunnions which are carried in V's of the ordinary form. The whole instrument packs into a box 28 × 12 × 18 cm. and only weighs four kilograms. The author does not say with what accuracy the horizontal component can be measured, but from some figures given it would appear that the declination can be determined to within about three minutes of arc; which, considering the small size of the instrument, is remarkably good. In order to facilitate the measurement of the bearing of landmarks, the telescope is supported on horizontal trunnions, so that it can be tilted in a vertical plane about 10° on either side of the horizontal.

THE "Proceedings of the Royal Physical Society of Edinburgh," Session 1893–94, is now ready, and may be purchased at the Society's rooms, George-street, Edinburgh.

PROF. J. SHIELD NICHOLSON'S lecture on "Historical Progress and Ideal Socialism," delivered at the Oxford meeting of the British Association, has been published in handy volume form by Messrs. A. and C. Black.

WE learn from the *Journal of Botany* that the monograph of the Mycetozoa, on which Mr. Arthur Lister has been engaged for some years, founded on the collection in the herbarium of the British Museum, will shortly be published.

UNDER the title "Nomenclator Coleopterologicus," H. Bechhold, of Frankfort-on-Maine, has published, for Herr S. Schenkling, an etymological index, together with a list of species and their varieties, of the beetles of German districts. The book should be extremely useful to students of Coleoptera.

MR. BERNARD QUARITCH, Piccadilly, has issued a list of choice and valuable books he has for sale, including the library of the late Warren De la Rue. Many important works on physics, chemistry, astronomy, electricity, mathematics, photography, and microscopy are contained in the catalogue.

WE have received from the Skandinavisk Antiquariat, Copenhagen, a catalogue of books, ancient and modern, of Iceland and Scandinavia, which they have for sale. The catalogue, which will be sent free to all applicants, contains particulars of books relating to bibliography, periodical literature, the languages of the north, runology, mythology, archæology, topography, &c.

CHILL October has come, and with it a new number of "The Country Month by Month," in which Mrs. Owen and Prof. Boulger describe the characteristics of the plant-world and bird-life during the month. The entomologist's main occupation in October is digging up subterranean pupæ, so the authors give a brief account of insect metamorphosis. The chapter on bird-life deals with the autumnal migration of our birds in a very interesting manner.

THE Zoological Society of Germany has conferred a great boon upon students of natural history by editing a reprint of the tenth edition of Linnæus' "Systema Naturæ." The first volume, dealing with the animal kingdom, has lately been published by Wilhelm Engelmann, Leipzig. It is well printed, and will be very acceptable to those who are not the fortunate possessors of a copy of the original tenth and standard edition of Linnæus' work.

THE sixteenth edition of their "Catalogue of Minerals and Mineralogical Subjects" has been issued by Messrs. G. L. English and Co., New York. The illustrations are all new, and a complete revision of all Messrs. English's systematic collections has been made. The species are classified according to Dana's new "System of Mineralogy" (1892). The index to the catalogue is particularly valuable, for it enumerates all species, and refers to the proper species all important synonyms and varieties.

A REMARKABLE new substance, obtained by the action of ordinary alcohol upon peroxide of sodium, is described by Prof. Tafel in the current *Berichte*. When alcohol is poured upon sodium peroxide, about half of the latter disappears to form a strongly alkaline solution which contains practically no active oxygen, while the remaining half undergoes a complete change. The pale yellow colour of the commercial peroxide becomes changed to pure white, and the substance assumes the nature of a fine granular powder, totally different from peroxide of sodium. This substance is soluble in water, but with much less rise of temperature than the peroxide. While the latter compound is stable up to a high temperature, evolving no oxygen when pure below red-heat, the new substance evolves large quantities of oxygen upon gently warming, and if rapidly heated in a tube closed at one end explodes with violence and production of flame. The powder behaves very curiously if touched in one place with a heated rod; the particles are set in rapid whirling motion by the escaping oxygen, and the rise of temperature is so great as frequently to terminate in local combustion. This unusual phenomenon gradually extends throughout the whole mass, oxygen being copiously and continuously evolved in an almost perfectly dry state. When much more strongly heated the substance melts and then evolves water vapour, the residue consisting of ordinary sodium hydrate. Analyses indicate that the substance possesses the composition $HNaO_2$. Its production from sodium peroxide and alcohol in all probability occurs in accordance with the following equation, sodium ethylate being the secondary product:

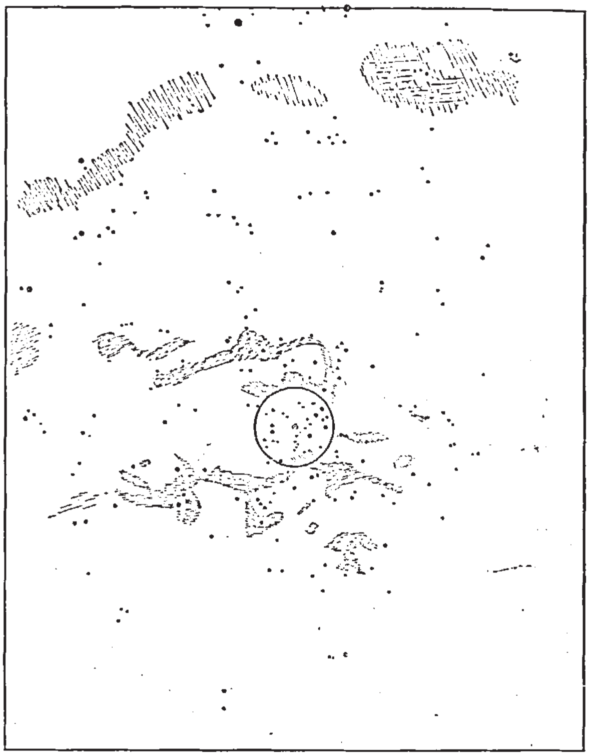
$$Na_2O_2 + C_2H_5OH = C_2H_5ONa + HNaO_2.$$

The probable existence of this new sodium compound was pointed out by Prof. Tafel in a previous communication concerning the action of alcoholic mineral acids upon sodium peroxide, and he has now been able to isolate it. He considers it to be the hydrate of a trioxide of sodium Na_2O_3. It dissolves in ice-cold water without decomposition, but at temperatures very little higher the solution slowly evolves oxygen. If alcohol is added to this solution the evolution of gas is considerably augmented and the solution deposits after some hours crystals of Mr. Vernon Harcourt's hydrate of sodium peroxide, $Na_2O_2.8H_2O$. Hydrochloric acid converts it into sodium chloride, hydrogen peroxide, and gaseous oxygen. In order to prepare the new compound, twelve grams of sodium peroxide and two hundred cubic centimetres of ice-cold absolute alcohol are convenient quantities to take; they should be well shaken together in a closed flask, the liquid and the fine white sandy product separated from any undecomposed lumps of peroxide, rapidly filtered, the white sand-like substance washed with cold alcohol and ether, and stored in a desiccator.

THE additions to the Zoological Society's Gardens during the past week include a Diana Monkey (*Cercopithecus diana*, ♀) from West Africa, presented by Mrs. Collcutt; a Mozambique Monkey (*Cercopithecus pygerythrus*, ♀) from East Africa, presented by Mr. H. J. Clowes; a Macaque Monkey (*Macacus cynomolgus*, ♂) from India, presented by Mrs. Morris; a Leopard (*Felis pardus*) from East Africa, presented by Mr. Thomas E. Remington; a Two-spotted Paradoxure (*Nandinia binotata*) from West Africa, presented by Dr. Sydney W. Thompstone; a Moose (*Alces machlis*, ♂) from Sweden, presented by Mr. Guy Nickalls; a Bennett's Wallaby (*Halmaturus bennettii*, ♂) from Tasmania, presented by Captain G. W. Brook; two Horned Screamers (*Palamadea cornuta*) from Para, presented by Mr. H. A. Astlett; a Banded Parrakeet (*Palæornis fasciatus*, ♀) from India, presented by Mr. Thomas Hodgson; a Green Turtle (*Chelone viridis*); a Hawks-billed Turtle (*Chelone imbricata*) from the East Indies, deposited; a Mexican Guan (*Penelope purpurascens*) from Central America, two American Wigeon (*Mareca americana*) from Brazil, a Short-tailed Parrot (*Pachyrus brachyurus*) from the Upper Amazon, purchased; two Raccoons (*Procyon lotor*); a Persian Gazelle (*Gazella subgutterosa*, ♂), born in the Gardens, three Bar-tailed Pheasants (*Phasianus reevesii*), an Amherst Pheasant (*Thaumalia amherstiæ*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN.

NEBULOSITIES NEAR THE PLEIADES.—For many years, says Prof. E. E. Barnard in the *Astronomische Nachrichten*, No. 3253, he has known of a vast and extensive nebulosity north of the Pleiades. This is not to be confounded with the nebulosities round the cluster revealed by photography during the last ten years, and all of which are included within the circle on the accompanying illustration. The wisps and patches of nebulous matter outside the circle are shown upon a photograph taken by Prof. Barnard with the Willard lens which he has rendered famous, the plate being exposed for ten hours, fifteen minutes.



The curved and streaky streams of celestial mist in the illustration are apparently connected with the Pleiades, though some of them extend irregularly for several degrees each side of the cluster. Prof. Barnard hopes to obtain still clearer pictures of the nebulosities by extending the time of exposure.

SCIENCE IN THE MAGAZINES.

EAST and west, as everyone knows, are merely relative terms. Elisée Reclus, in the *Contemporary*, traces the normal line of separation between the two halves of the ancient world which best deserve these names, considering the matter from an historical point of view. The true and natural partition between east and west of the ancient world is a transverse zone running from north to south between the Arctic Sea and the Gulf of Oram. This almost uninhabited zone begins just west of the plains of the Lower Indus, in the desert tracts of Lower Beluchistan, and ends in the barren reaches between the Obi and the Yenisei. Such a zone divides the world into two halves having continental masses of nearly equal size. The evolution of humanity was worked out differently on the two sides of this line, and the two developments are traced in the article referred to.

A very exhaustive article is contributed by Mr. John Rae to the same review, under the title "The Work of the Beer Money." The author describes what the County Councils have done for technical education since the passing of the Local Taxation (Customs and Excise Act) of 1890, when funds for the purpose of furthering such instruction became available. To those who expected great things, the survey will be disappointing; for it shows that in many cases the moneys have been expended almost uselessly. Better results, however, could hardly be expected, for it must be remembered that the County Councils had to create the machinery with which to carry on the work. On this account many mistakes have been made, "but," says Mr. Rae, "they [the Councils] have gone about matters in a practical way, and when they have made mistakes they have shown themselves quick to repair them. Much of the